

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 3, 4, 6, 11, 18, 19 28-30, 41 and 45-55 are pending in the present application. Claims 1 and 45 are amended by the present amendment. Claims 9, 10, 17, 20-25 and 31-40 are previously cancelled.

Claim amendments and new claims find support in the application as originally filed, for example, in Figs.21B, 21C and 21D and the corresponding disclosure. Specifically, these figures illustrate that the bottom voltage  $V_{pp}$  relative to a second harmonic (27.12 MHz), a third harmonic (40.68 MHz) and a fourth harmonic (54.24 MHz) is increased at points A1, A2 and A3, respectively. Thus, the harmonic is amplified by a resonance action applied by the impedance setting section. Thus, no new matter is added.

In the outstanding Office Action, Claims 1, 3, 4, 11, 28-30, 41, 45 and 47-53 were rejected under 35 U.S.C. §103(a) as unpatentable over Raoux et al. (U.S. Pat. No. 7,004,107, herein "Raoux") in view of Hoffman et al. (U.S. Pat. No. 7,030,335, herein "Hoffman"), Hirose (U.S. Pat. Pub. No. 2002/0007915) and Hilliker et al. (U.S. Pat. No. 7,042,311); Claims 6 and 46 were rejected under 35 U.S.C. §103(a) as unpatentable over Raoux, Hoffman, Hirose and Hillker et al. in further view of Collins et al. (U.S. Pat. No. 6,252,354, herein "Collins"); Claims 18, 19, 54 and 55 were rejected under 35 U.S.C. §103(a) as unpatentable over Raoux, Hoffman, Hirose, Hillker et al. in further view of Hillker (U.S. Pat. No. 6,631,693).

With respect to the above noted §103(a) rejections including the Hilliker et al. reference, Applicants respectfully traverse these rejections. Specifically, Applicants note that the effective filing date of the present application is July 19, 2002. In contrast, the filing date of the Hilliker et al. reference is October 10, 2003. Thus, Applicants note that under no

provision of 35 U.S.C. §102 or §103 is the Hilliker et al. reference available to be used to reject the present application. Accordingly, Applicants respectfully request that the §103(a) rejections in the outstanding Office Action, be withdrawn.

In addition, Applicants also respectfully traverse the §103(a) rejections relying on Raoux, Hoffman, Hirose and Hillker et al. for the following reasons.

Amended Claim 1 recites, in part,

an impedance setting section provided in addition to the matching circuit and arranged between said one of the first and second electrodes and the matching circuit on the first interconnection, the impedance setting section being configured to amplify by a resonance action a higher harmonic of a fundamental frequency of the RF power, which is input from the plasma into the first interconnection, and thereby set an impedance relative to the higher harmonic, the impedance setting section being capable of changing a higher harmonic to be treated as a resonance target

Raoux describes an impedance tuner 108 that is used for the impedance of reactor 30. However, as acknowledged on page 4 of the outstanding Action, Raoux does not describe or suggest the impedance setting section recited in Claim 1.

However, the outstanding Action relies on Hoffman as curing the above noted deficiencies of Raoux with regard to the impedance setting section recited in Claim 1.

Hoffman describes a plasma reactor for processing a semiconductor workpiece. In addition, Hoffman describes that the return path from the plasma through the overhead electrode 125 and coaxial inner conductor 140 is tuned to resonate at a particular HF frequency, the resonance being the second harmonic of the bias signal.

However, Hoffman further states in col. 21, lines 8 to 13 that “such a favorable result is achieved because harmonics generated by the non-linear load presented by the plasma sheath are quickly returned to ground through the low impedance path presented by the overhead electrode and coaxial center conductor 140 by virtue of the capacitive layer 360.”

In other words, Hoffman states that harmonics are directed to pass through the low impedance path and are thereby *decreased*. This results in the plasma being less affected by the harmonics and the etching rate being improved by 10% to 15%.

In contrast, the impedance setting section is configured to *amplify* the higher harmonic of a fundamental frequency by a resonance action, which is realized by reducing the impedance relative to the harmonic. This feature is not described or suggested by Hoffman.

Thus, Hoffman does not describe or suggest an impedance setting section being configured to amplify by a resonance action a higher harmonic of a fundamental frequency of the RF power, which is input from the plasma into the first interconnection, and thereby set an impedance relative to the higher harmonic, the impedance setting section being capable of changing a higher harmonic to be treated as a resonance target, as is recited in Claim 1.

In addition, none of the further cited Hirose or Hillker et al. references cures the above noted deficiencies of Raoux and Hoffman.

Accordingly, Applicants respectfully submit that Claim 1 and similarly Claim 45 and claims depending therefrom patentably distinguish over Raoux, Hoffman, Hirose and Hillker et al. considered individually or in any proper combination.

Further, the further cited Collins and Hilliker references do not cure the above noted deficiencies of Raoux, Hoffman, Hirose and Hillker et al.

Consequently, in light of the above discussion and in view of the present amendment the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.


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Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'SPW', is written over a horizontal line.

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